Which Materials are the Best Fit for Your Heat Exchanger Application?

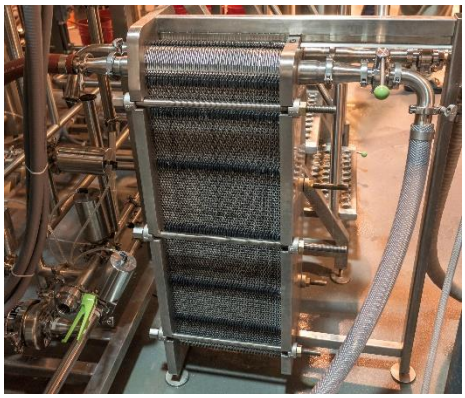
Heat exchangers are used in both the heating and cooling process to transfer thermal energy between two or more fluids. They can be found in a variety of industries from nuclear power to waste management, and within a broad range of applications from refineries to refrigerators. While the principal processes are similar among the varieties of heat exchangers found across the manufacturing spectrum, the specific application used for your heat exchangers will often dictate the materials your business requires.

Shell and tube heat exchangers are well suited for high pressure applications. They consist of a cylindrical shell with a bundle of tubes inside and transfer heat from within and around the bundle. Two fluids of different temperatures are found within this system; one being the process fluid, the other being the cooling medium, both kept in continuous circulation. In some cases, the tube bundle will expand and contract when the heat conditions change and can be easily removed for service and maintenance. This is one of the most common types of heat exchangers and is used in hydraulic and marine applications as well as swimming pools, refineries and other industries that require compact design and large volume capacity. Typical materials include titanium, stainless steel, carbon, brass and other alloys. United Performance Metals offers **Stainless Steel 304/304L, 316/316L, 321, 347, 410, Nickel Alloy 625,** and **Duplex Stainless Steel 2205** that may be a good fit for shell and tube heat exchangers**.** Detailed product information can be found on our website at www.upmet.com.

Air-cooled heat exchangers are pressure vessels which cool a circulating fluid within finned tubes by forcing ambient air over the exterior of the tubes. Sometimes known as induced draft, forced draft or fin-fan units, the air-cooled heat exchanger is different from shell and tube design in that it rejects heat from a fluid directly to ambient air rather than rejecting it to water first and then to air. They are well suited for vehicles and other mobile applications where no permanent cool water source is available. Applications include power generation, refrigeration, gas compression and condensers. Typical materials include duplex stainless steel, titanium, chrome moly, and stainless steel. Chemical, physical and mechanical properties of **Duplex Stainless Steel**

2205, Stainless Steel 304/304L, 316/316L, and Nickel Alloy 625 commonly used in air-cooled heat exchangers is available on our website www.upmet.com.

A **plate heat exchanger** is a specialized design well suited for the transfer of heat between medium and low-pressure fluids. Plate heat exchangers contain thin plates joined together with a small space between them allowing fluid to flow between a larger surface area. Also known as brazed, gasketed plate, plate fin, welded, micro plate, and frame heat exchangers, they are highly efficient and more compact in design than other forms of heat exchangers. Plate heat exchangers are an ideal choice for refrigerants in food and beverage processing and are also used in HVAC, engineering, heat pumps and chillers. Typical materials include stainless steel or titanium. Resistance to chemical corrodents and marine environments can also play a factor in material selection. Information on corrosion resistance and weldability of **Stainless Steel 304 and 316L** as well as many other products can be found on our website at www.upmet.com.



When considering which materials are best suited for a heat exchanger, thermal transfer, operating temperature and corrosion resistance are some key factors to consider. Physical and mechanical material properties are also significant as is ease of fabrication and ongoing maintenance. Ultimately, the materials selected for a heat exchanger may depend on the end use application. United Performance Metals offers Stainless Steel, Nickel Alloys, Cobalt Alloys, Cobalt Chrome Moly, Titanium, Duplex Stainless Steel, PRODEC®, Aluminum and Alloy Steel in a variety of forms including coil, sheet strip, plate, bar and near net shapes. Our experienced team would like to assist you in your material purchases. Contact us at sales@upmet.com or call 888.282.3292 for more information.